## Literature Review


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*Engineering Psychology Leader Series:*

# *Design and Construction of and Ancile-Driver IED Alert*

## *How far is too far?*

A service provided by the

**Engineering Psychology Program**


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## Description:

1. What is the best way in which to communicate to a soldier on a combat patrol information that could heighten his/her situational awareness (SA) towards known Improvised Explosive Devices?
2. There has been "very little work" in terms of determining the most effective way to communicate an alert to the soldier.
3. The Ancile alert design is basic and simple; intending to require the minimum tax on the soldier's SA.
4. What type of stimulus should be used to communicate the alert?

**Designed for soldiers...**

## Who, What, How?

~ Utilized a between subject's group study to contrast a traditional display to one with a reduced scale. A two sample T-test or ANOVA can be used to determine the significance of the difference between the displays.

## Devices

1. Audio—Presented as strobe beeping similar to that of an alarm clock or fire alarm. Each "beep" was presented 500 ms after the previous beep at a set frequency. The frequency for this alarm was constrained by the materials used to construct the device. The speaker for the alarm was mounted on the left shoulder of the participant's Load Bearing Vest (LBV).

2. Visual—Also presented as strobe flashing 500 ms apart. Because the visual alarm was a LED light mounted on a set of ballistic eyewear oriented towards the corner of the left eye, the speed of the flashes makes the stimulus appear brighter while still using the more tactical red color.

3. Tactile—Once again presented as strobe vibrations at 500 ms intervals. This frequency was near 125 Hz and was mounted in the participant's breast pocket of his/her uniform. This alarm utilizes a "whirl" vibration motor rather than a piston-driven vibration.

## Results

| HIT (H) | FALSE ALARM (FA) |
|---|---|
| EST: Lethal Shot on Enemy Target (avg. 4.2)<br>Sensory Stimuli: Acknowledgment of Alarm when present (85.7% of the time) | EST: Civilians fired upon (Total 2, 3.8%)<br>Sensory Stimuli: Acknowledgment of a nonexistent stimuli (Total 2, 8.3%) |
| **MISS (M)** | **CORRECT REJECTION (CR)** |
| EST: Failure to hit an Enemy target (avg. 5.8)<br>Sensory Stimuli: Failure to acknowledge an Alarm (14.3% of the time) | EST: No Civilians fired upon (95.2% of the time)<br>Sensory Stimuli: No acknowledgment of the nonexistent stimuli (occurred 91.7% of the time) |

## Discussion

- Study served as a pilot. Results were statistically insignificant.
- Future studies to statistically determine the best means to communicate "Danger Area" alerts, and "follow-on" information (what to do with the alert).

***Questions about Military Displays***

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